

Claims:

1. A backing for an abrasive article comprising a sheet-like polymeric substrate having a first major surface including a pattern of non-abrasive raised areas and depressed areas and an opposite second major surface including a plurality of shaped engaging elements that are one part of a two-part mechanical engagement system.
2. The backing of claim 1 wherein said pattern on said first major surface is a uniform pattern.
3. The backing of claim 1 wherein said shaped engaging elements comprise filament stems having flattened distal ends integrally shaped into said second major surface.
4. The backing of claim 1 wherein said shaped engaging elements comprise hook elements integrally shaped into said second major surface.
5. An abrasive article comprising:
  - a. a backing comprising a sheet-like polymeric substrate having a first major surface including a pattern of non-abrasive raised areas and depressed areas and an opposite second major surface including a plurality of shaped engaging elements that are one part of a two-part mechanical engagement system; and
  - b. an abrasive coating at least over said raised areas.
6. The abrasive article of claim 5 wherein said abrasive coating comprises abrasive particles and a binder.
7. The abrasive article of claim 6 wherein said abrasive coating has a shaped abrasive surface comprising raised areas and depressed areas.

8. The abrasive article of claim 5 wherein said pattern on said first major surface is a uniform pattern.

5 9. The abrasive article of claim 5 wherein said pattern on said first major surface is a random pattern.

10. The abrasive article of claim 5 wherein shaped engaging elements comprise filament stems having flattened distal ends unitarily shaped into said second major surface.

10 11. The abrasive article of claim 5 wherein said shaped engaging elements comprise hook elements unitarily shaped into said second major surface.

15 12. The abrasive article of claim 5 wherein said abrasive coating comprises a binder make coating into which at least a portion of each abrasive particle is embedded.

20 13. The abrasive article of claim 12 wherein the make coating is a binder selected from the group consisting of acrylate resins, epoxy resins, nitrile rubber resins, urethane resins, aminoplast resins, phenolics resins, urea-formaldehyde resins, polyvinyl chloride resins and butadiene rubber resins.

25 14. The abrasive article of claim 12 further includes a size coating over said make coating and said abrasive particles.

30 15. The abrasive article of claim 14 wherein the size coating is a binder resin selected from the group consisting of phenolic resins, aminoplast resins having pendant  $\alpha,\beta$ -unsaturated carbonyl groups, urethane resins, epoxy resins, ethylenically unsaturated resins, ethylenically unsaturated resins, acrylated isocyanurate resins, urea formaldehyde resins, isocyanurate resins, acrylated urethane resins, acrylated epoxy resins, bis-maleimide resins, fluorine-modified resins, and combinations thereof.

16. The abrasive article of claim 5 wherein abrasive particles comprise material selected from the group consisting of fused alumina, silicon carbide, alumina-based ceramics, zirconia, alumina-zirconia, diamond, ceria, cubic boron nitride, garnet, ground glass, quartz, and combinations thereof.

5

17. A method of making a backing for an abrasive article, said method comprising:

- a. extruding molten polymeric material to form a sheet having a first major surface and an opposite second major surface;
- b. contacting said first major surface of the molten sheet with a first tool having a contact surface including a pattern of non-abrasive raised areas and depressed areas to create in said first major surface a corresponding pattern of depressed areas and raised areas;
- c. contacting said second major surface of the molten sheet material with a second tool having a contact surface capable of creating therein a plurality of elements selected from the group consisting of shaped engaging elements and precursors to shaped engaging elements that will be one part of a two-part mechanical engagement system; and
- d. solidifying said molten sheet to provide said backing.

10

15

20

18. The method of claim 17 wherein steps (b) and (c) are carried out simultaneously.

19. The method of claim 17 wherein said polymer sheet is a coextruded polymer sheet comprised of at least two different polymer materials, each comprising a layer in the polymer sheet.

25

20. The method of claim 17 wherein said second tool includes a contact surface capable of producing erect stems each including a distal end and a contact end on said second major surface and including the further step of flattening the distal ends.

21. The method of claim 17 wherein said second tool includes a contact surface having cavities capable of producing hook elements each having a contact end on said second major surface.

5 22. A method of making an abrasive article, said method comprising:

- a. extruding molten polymeric material to form a sheet having a first major surface and an opposite second major surface;
- b. contacting said first major surface of the molten sheet with a first tool having a contact surface including a pattern of non-abrasive raised areas and depressed areas to create in said first major surface a corresponding pattern of depressed areas and raised areas;
- c. contacting said second major surface of the molten sheet material with a second tool having a contact surface capable of creating therein a plurality of elements selected from the group consisting of shaped engaging elements and precursors to shaped engaging elements that will be one part of a two-part mechanical engagement system;
- d. solidifying said molten sheet to provide said backing; and
- e. providing an abrasive coating at least over said raised areas of said first major surface.

10 20 23. The method of claim 22 wherein said abrasive coating is provided by:

- a. coating at least the raised areas of said first major surface with a make coating of curable binder composition;
- b. depositing abrasive particles onto the make coating of the curable composition; and
- c. at least partially curing the make coating composition.

25 30 24. The method of claim 23 further including coating the make coating and abrasive particles with a size coating of a curable binder composition and curing the size coating composition.

25. The method of claim 22 wherein said abrasive particles are provided to said first surface by mixing abrasive particles with a curable binder composition to provide a mixture which cures to provide an abrasive coating, coating at least the raised areas of said first major surface with the mixture and curing the curable binder composition.

26. The method of claim 25 wherein, after coating but prior to curing the curable binder composition containing abrasive particles, contacting the coating with a surface of a tool which includes raised areas and depressed areas to provide a shaped surface to the abrasive coating.

27. A backing for an abrasive article comprising a sheet-like substrate having a first major surface including a pattern of non-abrasive raised areas and depressed areas and an opposite second major surface unitarily including a plurality of shaped engaging elements that are one part of a two-part mechanical engagement system.

28. The backing of claim 27 wherein said non-abrasive raised areas are laminated to said first major surface and said depressed areas are defined by said first major surface.

29. An abrasive article comprising the backing of claim 27 having an abrasive coating coated over at least said raised areas.

30. A method of making a shaped backing for a coated abrasive article, said method comprising:

- a. providing a sheet-like backing having a first major surface and an opposite second major surface which unitarily includes one part of a two-part mechanical attachment system; and
- b. applying a plurality of separated, shaped structures to said first major surface, each of said structures having an attachment end attached to said first major surface and a distal end spaced from said first major surface with said shaped structures comprising distal ends aligned generally in the same plane.

31. The method of claim 30 wherein said plurality of separated, shaped structures are applied by applying molded molten polymer structures to said first major surface and permitting the molded molten polymer structures to cool to provide said separated, shaped structures.

5

32. The method of claim 31 wherein said backing is a fabric backing.

10033436-122801